

REMARKS

Claims 1, 2, and 4-18 are pending and have been examined in the present application. Claims 19-26 have been added to more fully claim the invention.

Applicant wishes to thank the Examiner for the indication in paragraph 6 of the Office Action that claim 13 would be allowable if rewritten in independent form. Applicant respectfully submits, however, that each of claims 1, 2, 4-12 and 14-18 also patentably distinguish over the art of record.

In paragraphs 3-4 of the Office Action, claims 1-2, 4-11, and 14-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,125,144 to Matsumura et al. (Matsumura) in view of U.S. Patent No. 4,984,076 to Watanabe et al. (Watanabe). Applicant respectfully traverses these rejections.

Among the limitations of independent claims 1, 5, 7-10, and 14-18 which are neither disclosed nor suggested in the prior art of record, is a block significance determining means that "calculates for each block a block feature that indicates picture quality other than a variance of each block." With the claimed block significance determining means, the encoding apparatus will appropriately select and execute "an intra-frame encoding operation or an inter-frame forecasting encoding operation for block." The claimed block significance determining means, including the advantages obtained thereby, are neither disclosed nor suggested in the prior art of record.

Matsumura discloses that conventional encoding systems supply two variance signals to the coding mode determination unit: the variance of signals in the current image block and the variance of the prediction error between the current image block and the predicted image block (known as motion compensation differential data variance) for the block in order to determine which coding mode to use. In a conventional system a comparison of "the source data variance with the motion compensation differential data variance [is made] to determine the compression mode to be used: INTER mode or INTRA mode." Matsumura, col. 6, ll. 19-23.

Matsumura further teaches that a variance of the differential signals between two consecutive frames with the motion vector set to zero can be used to determine the appropriate coding mode. This so-called "position-fixed differential data variance (SAD) indicates that the image in the corresponding position of the current frame is distorted." Col. 6, ll. 19-23. This SAD determines the temporal change in the block from the last frame. Fig. 17 illustrates three possible uses of this signal, which refreshes blocks based on the significance of their temporal change. Matsumura, however, fails to teach or suggest the use of a metric that indicates picture quality other than variance.

Watanabe fails to cure this deficiency. Watanabe discloses a method of distributing a fixed number of coding bits used to code a frame according to a local property within the frame. Watanabe, col. 1, ll. 40-42. Watanabe discloses an apparatus which performs a single encoding method which is now known as intra mode encoding. Watanabe teaches that the local property is used to determine how much data storage is necessary in order to encode a block, but does not disclose that such features should be used to determine whether to encode a block in intra mode or inter mode. Even if Matsumura and Watanabe were combined, Watanabe's teachings would apply to Matsumura's intra mode encoding. One skilled in the art would not use Watanabe's teachings in Matsumura's decision process to determine whether to encode in the intra mode or the inter mode. Therefore, the combination of Watanabe and Matsumura would not disclose the claimed block significance determining means. In view of the above, applicant respectfully submits that independent claims 1, 5, 7-10 and 14-18 are unobvious and patentably distinguish over the art of record.

Claims 2 and 6 depend directly from independent claims 1 and 5, and include all the limitations found therein. Each of these dependent claims include additional limitations which, in combination with the limitations of the claims from which they depend, are neither disclosed nor suggested in the prior art of record. Accordingly, claims 2 and 6 are likewise patentable.

Claims 4 and 11 were also rejected in paragraphs 3 and 4 of the Office Action. Among the limitations of claim 4 which are neither disclosed nor suggested in the prior art of record, is that the block significance determining means calculates a block feature that is "a quantity indicating power of a signal obtained by passing intra-block signals through a band-pass filter; and compares the block feature with one or more threshold values and thereby generating block significance for each block." Among the limitations of independent claim 11, which are neither disclosed nor suggested in the prior art of record, are that the block significance determining means "refers to information of a change in luminance of intra-block signals and a luminance level, thereby generating sensitivity information for the information according visual characteristics of a human, and calculating the sensitivity information as a quantity of a block feature" and "compares for each block, according to the block information, a quantity of visual deterioration representing a degree of visual picture deterioration when a forecast error signal is lost." Neither of these features has been disclosed nor suggested in Matsumura and Wantanabe, nor has there been a citation to these features in paragraphs 3 and 4 of the Office Action.

As admitted on page 3 of the Office Action, Matsumura fails to teach or suggest selecting an encoding mode based on "a quantity indicating power of a signal by passing intra-block signals through a band-pass filter." Additionally, with respect to claim 4, Wantanabe does not disclose calculating power of a band-pass filtered signal for the block, but rather discloses that the amount of data for each block can be computed on the basis of the variance in the result of band-pass filtering in consideration of the human visual characteristic of the block, or on the basis of the "power of all the transformation coefficients," which "weighting may be done to part of the coefficients in view of the visual characteristic." See column 12, lines 30-35. Since the combination of Matsumura and Wantanabe, as stated above, would not have resulted in applicant's invention, these claims are likewise believed to be allowable since they patentably distinguish over the art of record.

In paragraph 5 of the Office Action, claim 12 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsumura in view of U.S. Patent No. 4,651,206 to Ohki. Applicant respectfully traverses this rejection.

Among the limitation of independent claim 12 which is neither disclosed nor suggested in the prior art of record is that the apparatus comprises a refresh history determining means that refers “to history of the refresh map signal and a refresh signal, modifying a value of forced refreshed priority indicated by the refresh map signal, and thereby generating a modified refresh map signal.” The claimed refresh history determining means, including the advantages obtained thereby, are neither disclosed nor suggested in the prior art of record.

As admitted by the Office Action, Matsumura fails to disclose refresh history determining means for temporarily keeping therein the refresh map signal.

Okhi discloses an inter-frame coding apparatus that uses a register to inhibit motion compensation in blocks that have just been refreshed. The inhibited motion compensation helps to reduce or eliminate the possibility that an error in the signal is magnified. However, Okhi does not teach referring to the history of the refresh map signal as required by claim 12. In contrast, Okhi teaches delaying the refresh execution signal by a period of end lines in response to a set pulse which is supplied from control circuit 17 through signal line 20. See Okhi, column 4, lines 11-27 and Fig. 3. Since these features are not disclosed by Okhi, and it is admitted that they're not disclosed by Matsumura, claim 12 cannot be rendered obvious by these references.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

By 

Robert G. Gingher

Registration No.: 45,755

DICKSTEIN SHAPIRO MORIN &
OSHINSKY LLP

1177 Avenue of the Americas

41st Floor

New York, New York 10036-2714

(212) 835-1400

Attorney for Applicant